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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/042,971	01/07/2002	Van Jacobson	3510.53US01	6674

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EXAMINER	
LEE, CHRISTOPHER E	

ART UNIT	PAPER NUMBER
2112	

DATE MAILED: 08/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/042,971	JACOBSON, VAN	
	Examiner	Art Unit	
	Christopher E. Lee	2112	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,11-19 and 32-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,32-41 and 44-46* is/are allowed.

6)☒ Claim(s) *2-5 and 11-19* is/are rejected.

7)☒ Claim(s) *42 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Receipt Acknowledgement

1. Receipt is acknowledged of the request filed on 17th of July 2006 for a Request for Continued Examination (RCE) under 37 CFR 1.114 based on the Application No. 10/042,971, which the request is acceptable and an RCE has been established. Claims 1-3, 6, and 11-13 have been amended; claims 10 and 20-31 have been canceled; and claims 32-46 have been newly added since the Final Office Action was mailed on 15th of February 2006. Currently, claims 1-9, 11-19, and 32-46 are pending in this Application.

Response to Amendment

2. The Amendment document in the Response is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121, as amended on June 30, 2003 (*See 68 Fed. Reg. 38611*, Jun. 30, 2003). In fact, the text of any added matter for the amendment by replacement on Specification and Claim must be shown by underlining. In this case, the Applicant adds the indefinite article "a" prior to the term "fewer" in line 25 of the claim 11 without underlining. The Examiner presumes the above mentioned "a" in the Amendment document as the word of added matter for the amendment by replacement on Claim.

Claim Objections

3. Claims 12 and 42 are objected to because of the following informalities:

The claim 12 recites the subject matter "the plurality of entities" in lines 3 and 4. However, it has not been specifically clarified in the claim 12 and its intervening claims. Therefore, the Examiner presumes that the term "the plurality of entities" could be considered as --the plurality of CPUs-- in light of the specification since it is not defined in the claims.

In the claim 42, it recites the subject matter "the communication medium" in line 21. However, it has not been specifically clarified in the claim 42. Therefore, the Examiner presumes that the term "the communication medium" could be considered as --the communications medium-- in light of the specification since it is not defined in the claim.

In addition, it recite the subject matter "an input communication" line 16. However, the claimed subject matter "an input communication" in line 14 is the same that the recited subject matter "an input communication" in line 16. Thus, the recited subject matter "an input communication" in line 16 should be "the input communication" in light of the specification.

Furthermore, the language "transfering" in line 16 should be corrected by --transferring--.

Appropriate corrections are required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 2-5 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling private memory A for being available to CPU A, but not CPU B and CPU C, for example (See Specification, page 10, line 19 through page 11, line 1), does not reasonably provide enablement for one of the first and second private memories inaccessible by at least one of the first and second CPUs (See Claim 2, lines 4-6). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make/use the invention commensurate in scope with these claims.

In fact, the scope of the claimed invention in Claim 2 does not provide that the claimed subject matters "first private memory" and "second private memory" are not accessible by anyone of the

claimed subject matters "first CPU" and "second CPU," because the claim 2 recites the limitation "one of the first and second private memories inaccessible by at least one of the first and second CPUs." In other words, the limitation could be interpreted as (1) the first private memory inaccessible by the first and second CPUs, or (2) the second private memory inaccessible by the first and second CPUs, etc. The claims 3-5 are dependent claims of the claim 2.

6. Claims 11-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amended claim 11 recites the limitation "a second interface coupled to a fewer than all of the plurality of CPUs having an input for receiving a response to the communication from at least one of the at least one of the plurality of CPUs" in lines 25-27. However, the claimed limitation was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The claims 12-19 are dependent claims of the claim 11.

Allowable Subject Matter

7. Claims 1, 6-9, 32-41, and 44-46 are allowed.

8. Claims 2-5 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 1st paragraph, set forth in this Office action.

9. Claims 11 and 13-19 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 1st paragraph, set forth in this Office action.

10. Claim 12 would be allowable if rewritten or amended to overcome the rejections under 35 U.S.C. 112, 1st paragraph, and further if rewritten or amended to overcome the claim objection under minor informality, set forth in this Office action.

11. Claims 42 and 43 would be allowable if rewritten or amended to overcome the claim 42 objection under minor informality, set forth in this Office action.

12. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 1, the claim limitations are deemed allowable over the prior art of record as the prior art fails to teach or suggest that providing the communication stored in the shared memory directly to at least one of the first and second CPUs over the communication interconnection mechanism without causing an interrupt of the operating system and independently of the system I/O bus; executing at least one of the one or more processes on at least one of the first and second CPUs to generate at least a portion of the response to the communication; and receiving the generated portion of the response to the communication from the at least one of the first and second CPUs in the respective private memories associated with each of the first and second CPUs.

The claims 2-9 are dependent claims of the claim 1.

With respect to claim 11, the claim limitations are deemed allowable over the prior art of record as the prior art fails to teach or suggest that a first storage operatively connected to an incoming interface manager and a shared memory interface, the shared memory interface communicatively coupled to the plurality of CPUs via a communications interconnection mechanism, the incoming interface manager having an input coupled to the incoming communication interface output, the incoming interface manager operative for directly storing the communication received at the incoming interface manager input into the first storage independent of CPU intervention, the shared memory interface operative to provide shared

access to the shared memory by the plurality of CPUs using the communications interconnection mechanism for retrieving at least a portion of the stored communication from the first storage and for providing the retrieved communication to at least one of the plurality of CPUs.

The claims 12-19 are dependent claims of the claim 11.

With respect to claim 32, the claim limitations are deemed allowable over the prior art of record as the prior art fails to teach or suggest that an incoming shared memory operatively coupled to an input interface and a shared memory interface, the shared memory interface operatively coupled to the at least one main processing unit via a communications interconnection mechanism, the input interface operative to receive and store at least a portion of the communication in the incoming shared memory independently of the communications interconnection mechanism and independently of the operating system, the incoming shared memory operative to arbitrate shared access to the portion of the stored communication by the at least one main processing unit independently of the input interface and unaccompanied by an interrupt to the operating system; and an outgoing shared memory operative to retrieve and selectively output the portion of the response from the private memory independently of the communications interconnection mechanism and unassisted by the operating system.
The claims 33-37 are dependent claims of the claim 32.

With respect to claim 38, the claim limitations are deemed allowable over the prior art of record as the prior art fails to teach or suggest that a communications interconnection mechanism operably coupled to the one or more processing units and the shared memory via a shared memory interface, the communications interconnection mechanism operative to at least partially enable interprocessor communication and shared access to the shared memory by the one or more processing units wherein the input interface is adapted to perform the write

operations and optionally update the software pointers, the one or more processing units configured to perform the read operations arbitrated by the shared memory interface such that each processing unit reads input communications stored in non-overlapping regions of the second portion of the physical storage locations for processing into a response written to the private memory via the process associated with the processing unit, the memory map characterized in that the first portion of the physical storage locations for write operations include physical storage locations devoid of input communications or storing input communications that have been read as a result of the read operations wherein the read and write operations avoid generating an interrupt to the first operating system environment and avoid inter-processor communication.

The claims 39-41 and 45 are dependent claims of the claim 38.

With respect to claim 42, Applicant's Admitted Prior Art (hereinafter AAPA) discloses a method for processing a communication in a computer system (i.e., computer system 150 of Fig. 1B; See page 8, lines 9-12), wherein providing an input interface (e.g., I/O interface B of Fig. 1B) to a communications medium (i.e., Devices 178 of Fig. 1B); coupling a shared memory (i.e., Shared Memory 192 of Fig. 1B) to the input interface (in fact, said Shared Memory is coupled to said I/O interface B via said Front Side Bus in Fig. 1B), the shared memory (i.e., said Shared Memory) including one or more physical storage locations (See page 11, lines 4-7); operatively coupling a plurality of processors (i.e., CPU A 182, B 184, and C 186 in Fig. 1B) and a plurality of private memories (i.e., Private Memory A 198, B 194, and C 196 in Fig. 1B) to a communications interconnection mechanism (i.e., Front Side Bus 188 of Fig. 1B) and coupling the communications interconnection mechanism (i.e., said Front Side Bus) to the shared memory to enable the plurality of processors to share access to the shared memory (See page 10, lines 17-19) and enable each processor dedicated access to one of the plurality of private

memories (See page 10, line 19); providing each processor with a process running under a first operating system (e.g., Solaris operating system; See page 9, line 17 through page 10, line 5). Slane [US 6,438,651 B1] discloses a method for managing requests to a cache (See col. 1, lines 7-10), wherein updating a set of software pointers (i.e., header 64 and tail 66 in Fig. 2) to at least a portion of physical storage locations so that a portion of a shared memory is organized as a circular buffer (i.e., circular data structure 62 of Fig. 2; See col. 3, lines 40-42); receiving an input communication and storing it directly into the circular buffer (i.e., enqueue operation) at a first tail location of the circular buffer (See col. 3, lines 53-55); and transferring the input communication (i.e., dequeue operation) at a head of the circular buffer (See col. 3, lines 55-57) to one of processing units (i.e., CPU in Queue User 52 of Fig. 3; See col. 3, lines 32-34). However, one of ordinary skill in the art would not have been motivated to modify the teachings of AAPA and Slane, alone or in combination with other references, in order to provide specific claimed method of executing the process to generate a response communication based upon the input communication transferred to the processing unit; and storing the response in the private memory associated with the processing unit for transmission to the communication medium.

Therefore, the claim limitations are deemed allowable over the prior art as the prior art fails to teach or suggest that providing each processor with a process running under a first operating system; updating a set of software pointers to at least a portion of the physical storage locations so that a portion of the shared memory is organized as a circular buffer; receiving an input communication and storing it directly into the circular buffer at a first tail location of the circular buffer; transferring an input communication at a head of the circular buffer to one of the processing units; executing the process to generate a response communication based upon the

input communication transferred to the processing unit; and storing the response in the private memory associated with the processing unit for transmission to the communication medium. The claim 43 is a dependent claim of the claim 42.

With respect to claim 44, the claim limitations are deemed allowable over the prior art of record as the prior art fails to teach or suggest that directly writing at least a portion of the incoming communication to the at least one writable location unassisted by the operating system; selectively allowing one of the plurality of processes to directly read at least the portion of the incoming communication from the at least one readable location avoiding interrupt generation to the operating system; and processing the retrieved portion of the incoming communication using the selected process to generate and store a response in the private memory avoiding inter-processor communication between the one or more CPUs. The claim 46 is a dependent claim of the claim 44.

Response to Arguments

13. Applicant's arguments with respect to claims 1 and 11 have been considered but are moot in view of the allowed claim 1 and the new ground of claim 11 rejection.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Robins et al. [US 6,484,224 B1] disclose multi-interface symmetric multiprocessor.

Chong, Jr. et al. [US 6,651,131 B1] disclose high bandwidth network and storage card.

Slane [US 6,438,651 B1] discloses method and system, and program for managing requests to a cache using flags to queue and dequeue data in a buffer.

Yazaki et al. [US 6,434,153 B1] disclose packet communication system with QoS control function.

Terada et al. [US 4,884,192] disclose information processor capable of data transfer among plural digital data processing units by using an active transmission line having locally controlled storage of data.

Wootten et al. [US 6,754,819 B1] disclose method and system for providing cryptographic services in a distributed application.

Henrion [US 6,728,256 B1] discloses shared buffer control device.

Smirnov et al. [US 2003/0177292 A1] disclose data format for streaming information application.

Chi et al. [US 5,940,870 A] disclose address translation for shared-memory multiprocessor clustering.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher E. Lee whose telephone number is 571-272-3637. The examiner can normally be reached on 9:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rehana Perveen can be reached on 571-272-3676. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private

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Christopher E. Lee
Examiner
Art Unit 2112

CEL/ CEL